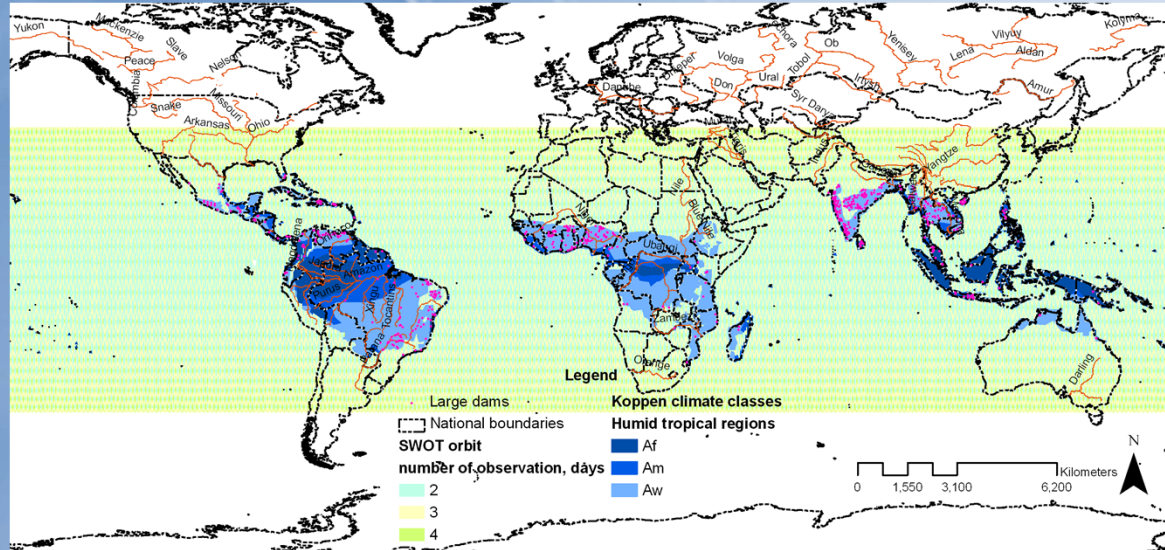


Improving the Accuracy and Reliability of Space-Borne Discharge Estimation from SWOT for Low-lying Humid Tropical Regions of the World



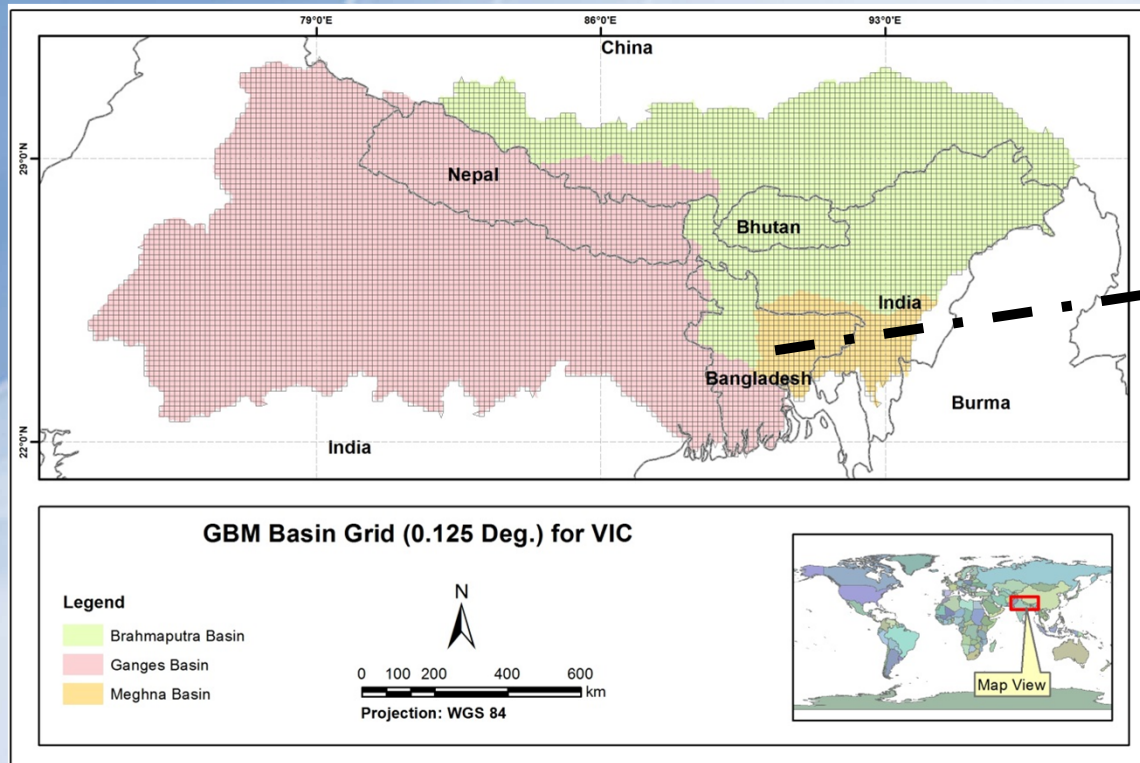
- ❑ Discharge estimation during peak season in low-lying humid tropical regions very challenging
- ❑ Extensive dams, cloud cover, moist soils, inundation and 'non-stop' rain.

- 23% of World landmass; 1/5th of work population
- Represents majority of Global Discharge & Freshwater flux to Oceans: Ganges, Brahmaputra, Nile, Mekong, Amazon, Congo, Irrawady and Indus
- Increasing impoundments (dams) on lower-order (upstream) rivers/tribut.
- Peak discharge is seasonal - During monsoon; extensive cloud cover and widespread rain systems
- Emerging economies, Eight Megacities on Deltas; Rising freshwater scarcity

Specific Objectives

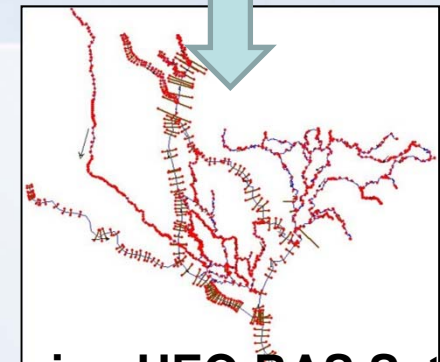
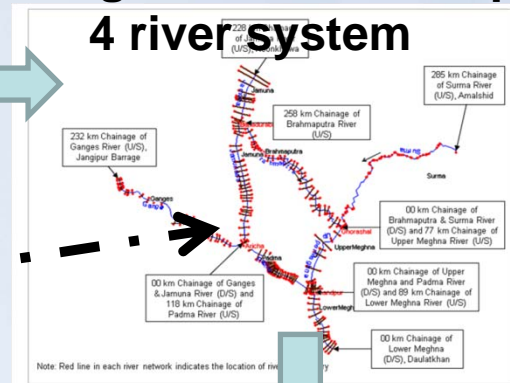
Obj. 1 What role do the key geophysical features play in the accuracy of SWOT discharge estimation in humid rivers? Herein, the key geophysical features are cloud-cover, land-water mask, rain rate, river morphology and human settlements in floodplain of large rivers.

Obj. 2 How can the uncertainty of discharge estimation in humid tropical regions be minimized and synergized with the on-going evolution of data assimilation schemes for SWOT?



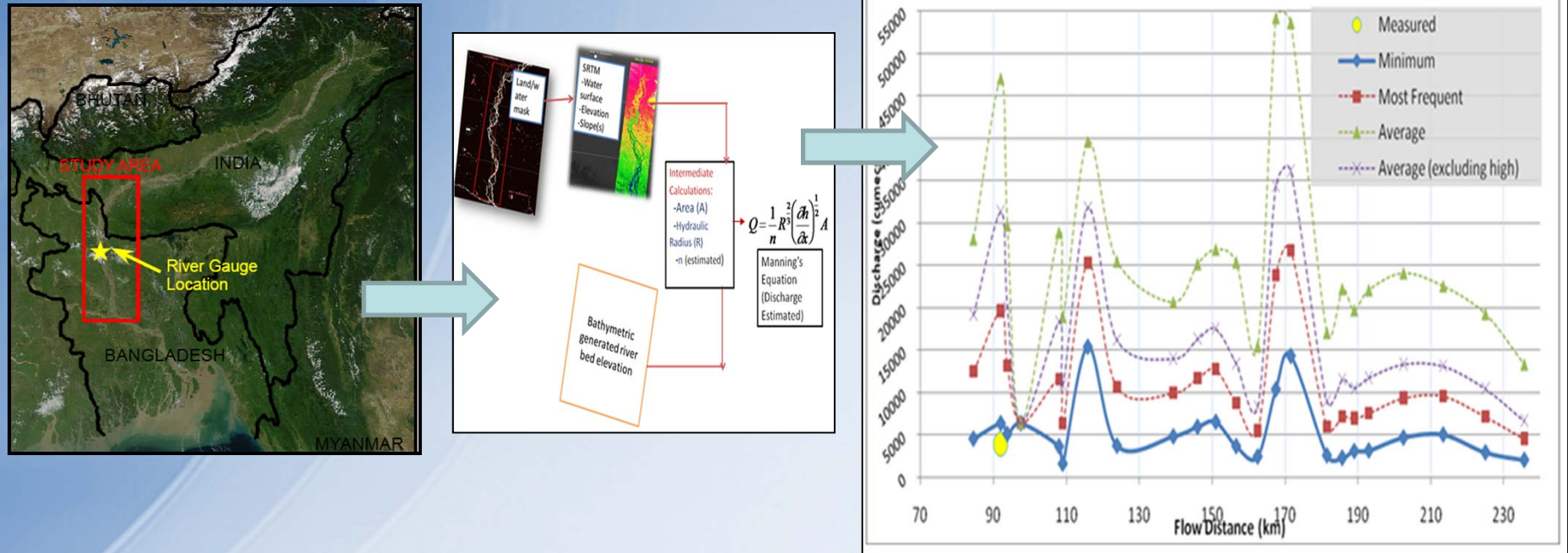
VIC-3L is set up over Ganges-Brahmaputra-Meghna Basins for 2002-2010/present

Existing HEC-RAS Set up – 4 river system



Ongoing HEC-RAS Set up – 100+ river system

Relevance to Phase-A SWOT Issues



Woldemichael et al 2010 - IEEE JSTARS

In the first phase, proposed research will replicate the JSTAR study on the **100+ river system in HEC RAS** using SRTM and altimetry data (T/P, JASON-2) to understand/validate:

- 1) Relationship of rain rate (x-axis), cloud cover (x-axis), river width (x-axis) and land/water mask (&R_H) (x-axis) with accuracy of discharge estimation (y-axis).
- 2) Role of flow regimes, river types (for various widths, depths, conveyance)
- 3) Ways to minimize outliers in discharge estimation similar to above figure on right
- 4) Potential extension of work to Indus basin.